ARCS ORANGE COUNTY CHAPTER
Newsletter - April 2016

Featured Events

2016 Scholar Awards Dinner

Tour of UCI School of Physical Sciences

Lunch with a Scientist

Featured Scholars

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Zachariah Reagh

LA Chapter Event

From Sputnik To Endeavor

OC Chapter Board 201516

pH Reading from the President

Dear ARCS OC Chapter members and friends,

In this April newsletter we are sharing ARCS OC Chapter news from our recent events and featuring two of our 2015-2016 ARCS Roche Scholars, Zachariah Reagh and Caitlin Regan. They join over 7500 ARCS

Foundation Scholars who have received ARCS scholarships supporting advancement of science in America. ARCS Orange County Chapter Scholar Awards recognize UC Irvine's most academically superior doctoral students exhibiting outstanding promise as scientists, researchers and leaders. Each recipient receives an award that is in addition to his or her existing support from the university.

"Because of ARCS Foundation OC Chapter support, I was able to attend several conferences that would have not otherwise been possible. In addition to the personal and financial support, the wonderfully active nature of the ARCS leadership and members has provided me with invaluable experiences to meet and network with world leaders in both academic and industrial sciences." Sumner Norman, ARCS Scholar 2016

We hope you find this newsletter informative and invite you to join us in the ARCS Foundation challenge to "advance science in America".

Chandra Jain, President

2016 Scholar Awards Dinner

The 16th ARCS OC Annual Awards Dinner was held on March 23 at the Arnold and Mabel Beckman Center of the National Academies of Sciences and Engineering, Irvine, CA.

ARCS Orange County Chapter provides awards to exceptional PhD students at UC Irvine in the schools of Biological Sciences, Engineering, Information and Computer Sciences, Medicine and Physical Sciences.

The evening began with a reception and poster session, followed by keynote talks by the Second-Year Scholars. Kristine Dahl Arquero, Sarkis Babikian, Thomas Baker, Kyle Benson, Clayton Elder, Nan Wu Hultgren and Sumner Norman.

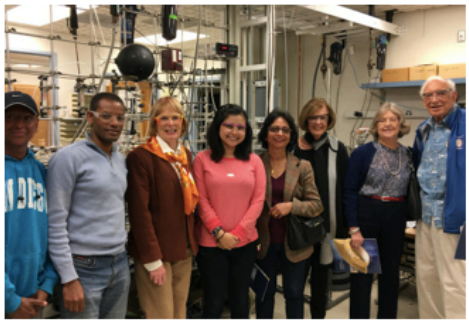
The enthusiasm for the scholars' research was very apparent as they talked about their diverse interests; neuroinflammation blood vessel production in cancer tissue, wearable health monitoring devices, Learning, Memory and Aging, Big Data analytics, Star Formation, Arctic Greenhouse gas emissions, and many more.

Thank you to all who helped make this a very successful event. A wonderful evening highlighting the impact ARCS Scholar Awards has on ensuring that exceptional scientists have the opportunity to pursue their boldest ideas.

UCI School of Physical Sciences Tour

ARCS members and friends went on a field trip to the UCI School of Physical Sciences on March 30 with a tour of research labs in Earth System Science and Chemistry.

The tour began with an introduction to the school by Dean Ken Janda in the foyer of Roland Hall. A fitting place to start our adventure, as it is filled with a beautiful display of historical memorabilia honoring the work done by UCI Nobel Prize winning Professor Sherry Roland and his research group. In this building he discovered chlorofluorocarbons (CFCs) released into the atmosphere from common household products like hairsprays and deodorants were depleting the earth's vital ozone layer.


Our first research lab visit on the tour was with Professor Vy Dong and her research group in Croul Hall. We had only a short time, but learned a whole lot about organic chemistry and the importance of her work in developing new reaction methods. See Professor Vy Dong's exciting story on the TEDx UCI lecture ,"CHON, An Organic Love Story". You will be amazed.

Next up, a visit to Air UCI Professor Barbara Finlayson-Pitts. Her research group specializes in small particles polluting the atmosphere and puzzling out the intricate interactions between fine particle pollutants less than one-thirtieth the diameter of a human hair and their environment. There were impressive talks from her graduate students who showcased their work on some very complex instruments.

Our final stop was with Professor Katherine MacKey. Professor MacKey's research group studies algae, understanding how photosynthesis shapes, and is shaped by, biological, chemical, and physical processes in the ocean. Her research group is particularly interested in how phytoplankton will adapt to global change. Professor MacKey studies ocean environment in many areas around the globe, including samples collected right off the pier in Newport Beach. Professor MacKey will be the speaker at the April 19 School of Physical Sciences Public Breakfast Lecture series. This is open to the public and free. For more information and how to RSVP for this event on the Physical Sciences News and Events web page.

ARCS OC Chapter Lunch with a Scientist

Greg Weiss, discussed the fascinating and surprising universe of the very small, measured in nanometers at the annual Lunch with a Scientist on February 3, 2016. . His inventions manipulate the nanometer-scale world of proteins. For example, his laboratory invented a mechanical machine for driving proteins into their natural, beautifully folded states. To demonstrate the power of this approach, he and his co-workers demonstrated the recovery of a key protein in the egg whites of hard-boiled eggs, a feat termed "unboiling an egg" by news outlets from around the world. Read more about this fascinating research on the UCI News web, "UCI, fellow chemists find a way to unboil eggs".

Featured Scholars - Zachariah M. Reagh, Roche/ARCS Scholar, School of Biological Sciences

Zachariah Reagh graduated with a B.S. in Psychology and a B.A. in Philosophy from the University of Alabama at Birmingham. Presently, he is a fourth year Ph.D. student in the lab of Dr. Michael Yassa in the Departmentof Neurobiology and Behavior in the Francisco J. Ayala School of Biological Sciences at UC Irvine. Broadly, his interests lie in the neurobiological basis of memory.

Though he is involved in various research projects and has authored a number of publications during hi time in graduate school, the topic of his dissertation is the division of labor in the medial temporal lobes (MTL) of the brain in the service of creating, storing, and retrieving memories. Our life events are rich and dynamic, made up of details such as "what" happened and "where" it happened, which create memories that are similarly rich and dynamic. Previous research has shown us that different components of a memory are supported by different regions of the MTL. In particular, memory for "what" seems to engage regions of the lateral entorhinal and perirhinal cortex (LEC & PRC), whereas memory for "where" seems to engage regions of the medial entorhinal and parahippocampal cortex (MEC & PHC). These two networks both send information to the hippocampus, a part of the brain critical for forming memories of events. Much of this work has been done in animal models and, in particular, the division between the medial and lateral entorhinal cortex has been elusive in humans.

Toward this end, Zach designed a behavioral paradigm to tease apart detailed memory for "what" and "where." Combining this approach with high-resolution magnetic resonance imaging (MRI) of the human brain, he has been able to demonstrate novel evidence for distinct "what" and "where" memory pathways in healthy young adults (Reagh & Yassa, *Proceedings of the National Academy of Sciences* 2014).

However, this proof-of-concept in humans is just the tip of the iceberg. Research in aging and Alzheimer's disease has found that the LEC & PRC, making up the "what" pathway, are vulnerable to neurodegeneration at early stages of dementia. In fact, these abnormalities occur even before memory loss. Therefore, our paradigm has great potential to assist us in early detection of age-related abnormalities in brain activity. Dr. Yassa and Zach have received funding from the National Institutes of Health to conduct a series of experiments to test the prediction that activity in the LEC & PRC "what" memory pathway can be used to predict whether someone is on a path toward healthy aging versus dementia. These experiments are currently ongoing, and are expected to result in several presentations and publications in the coming years. Funding from ARCS and Roche has allowed Zach to present his work at several conferences over the last two years, and has facilitated collection of pilot data for full-scale experiments.

Outside of research and academics, Zach enjoys spending time hiking, camping, bicycling, cooking, and generally adventuring with his fiancée, Sarah, and their two dogs. He also dabbles in playing the guitar and enjoys reading all sorts of things (ranging all the way from literature to statistical theory).

Invitation to attend - ARCS Los Angeles Chapter - GALA 2016 - Sunday, May 15, 2016

The ARCS LA Chapter will be hosting a Gala honoring the Malouf family on Sunday, May 15, at the California Science Center, Samuel Oschin Space Shuttle Endeavor Display Pavilion. The event starts with a reception at 6:15 pm, followed by dinner at 7:00pm and guest speaker, Captain Mark Kelly.

Florence Malouf and three close friends founded the ARCS Los Angeles Chapter a year after the race for space and launch of the Russian satellite Sputnik in 1957. While NASA scientists spearheaded the early space missions, ARCS scholars surely provided back-up assistance. These great events were the culmination of the original vision of Florence Malouf and, along the way, Marlene Malouf Hall who founded the ARCS Auxiliary for younger members. The current generation of Maloufs – Gary, Robert, and Carol – has assisted ARCS as it has grown into the STEM supporting giant that we celebrate and promote today.

This will be a wonderful gala and celebration. Dress; Cocktail Attire, Valet Parking/Shuttle bus from Los Angeles Country Club departs at 5:30. Individual Tickets: $150. For more information and to RSVP contact the LA Chapter at losangeles@arcsfoundation.org, phone: (310) 375-1936

ARCS Foundation advances science and technology in the United States by providing financial awards to academically outstanding U.S. citizens studying to complete degrees in science, engineering and medical research. Since 1999, the ARCS Orange County Chapter has provided 232 scholar awards totaling over $2,000,000 at UCI.

To learn more about ARCS Orange County Chapter, sponsor a scholar, donate, or become a member, please visit our web page, https://www.arcsfoundation.org/orange_county/

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